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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,755	06/28/2001	Lawrence M. Burns	1875.0350001	3392

26111 7590 06/05/2003

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EXAMINER
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LEE, BENNY T

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES DEPARTMENT OF COMMERCE  
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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	5

DATE MAILED:

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on 7 Mar 2003 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire Three (3) month(s), \_\_\_\_\_ days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948.                  |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449       | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152 |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474      | 6. <input type="checkbox"/> _____   |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-39 are pending in the application.  
Of the above, claims 2-6, 9, 11-21, 23-34 are withdrawn from consideration.
2. ☐ Claims \_\_\_\_\_ have been cancelled.
3. ☐ Claims \_\_\_\_\_ are allowed.
4. ☒ Claims 1, 7, 8, 10, 35; 33; 36-39 are rejected.
5. ☐ Claims \_\_\_\_\_ are objected to.
6. ☒ Claims 1-39 are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.
8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. These drawings are: ☐ acceptable;  
☐ not acceptable (see explanation).
10. ☐ The ☐ proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections **MUST** be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.
12. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received  
☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

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Applicant's election of Species I, claims 1-4, 7, 10, 11, 22, 23 and newly added claims 35-39 in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

However, a review of the claims indicated that claims 2-4, reciting a printed circuit board and a ground, does not belong with the elected species. Also, claim 8 is generic and must be included in the elected species. Furthermore, the specific transmission lines (cl 11) and the applied current signals (cl 23) do not belong to the elected species.

Claims 2-6, 9, 11-21, 23-34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made without traverse in Paper No. 4.

The disclosure is objected to because of the following informalities: Page 1, paragraph 0003, note that --of a-- should follow "example" for grammatical clarity. Page 3, paragraph 0012, should --prior art-- follow each occurrence of "classic" for a proper characterization? Page 5, paragraph 0036, note that "circuit 138" should be separated and --(e.g. see Fig. 2B)-- should follow "220" for clarity. Page 13, paragraph 0066 and page 16, paragraph 0072, note that --(see Fig. 1A)-- should follow "120" for clarity. Page 13, paragraph 0066 and page 16, paragraph 0073, note that --(see Fig. 1A)-- should follow "132" for clarity. Page 13, paragraph 0066 and page 16, paragraph 0074, note that --(see Fig. 5A)-- should follow "500" for clarity. Page 14, paragraph 0069, note that --(see Fig. 5A)-- should follow "530". Page 16, paragraph 0074, note

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that "signal 122 frequencies" should be rephrased into a better form. Page 17, paragraph 0075, and page 18, paragraph 0079, note that --(YES)-- should follow "equal or better" and --(NO)-- should follow "design goal performance" for consistency with the drawing figures. Page 18, paragraph 0079, note that --1600-- should follow "design" for consistency with the drawings figures.

Appropriate correction is required.

The disclosure is objected to because of the following informalities: Note that the following reference labels need explicit description in the specification: fig. 1B (116, ~~75~~<sup>75Ω, λ/4</sup>); figs. 2A, 2B (s,w,h, ~~Cr~~); fig. 5B, all reference labels except "512"; fig. 7 (.425"); fig. 8 (800, 808); Figs. 8, 10, 11, the dimensions labeled therein; fig. 12 (1200).

Appropriate correction is required.

The drawings are objected to because of the following: In figs. 1B, 2A, 2B, should these drawing figures be labeled as --PRIOR ART--? In Fig. 4B, note that capacitor "404" should correctly be labeled as --402--; In fig. 5B, should general label "550" correctly be --500--?; also in Fig. 5B, note that reference label --501-- should be provided as to be commensurate with the specification description; In fig. 10, note that reference label (512, 1006) need to be provided; In Fig. 13, step 1310, note that "trade" should correctly be --trace--. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Claim 22 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for means for reducing a physical dimension of said metal traces through the use of coupling capacitor as disclosed at paragraph 0054 of the specification, does not reasonably provide enablement for all other possible “means for reducing a physical dimensions of said metal trades”. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. It should be noted that the broad recitation “means for reducing a physical dimension...” is enable by the use of coupling capacitors as disclosed in the specification. Accordingly, it is unclear what other mechanisms for “reducing a physical dimension” other than coupling capacitors are contemplated by applicants’ to realize the invention. Therefore, absent such disclosure, the “means for reducing a physical dimension” is not fully enabling to permit one skilled in the art to make and use the invention, as intended by applicants’.

The following claims have been found objectionable for reasons set forth below:

In claim 1, note that --plurality of-- should precede appropriate occurrences of “first coupled...” and second coupled...” for consistency.

In claim 7, last line, note that “input to” should be rephrased as --received at-- for a proper characterization.

In claim 8, note that “are” should be rewritten as --comprise respective--for a proper characterization.

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In claim ~~22~~<sup>21</sup>, should the "input" and "output" be "coupled" to --corresponding-- ones of "said metal traces" for a proper characterization? The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim ~~22~~<sup>21</sup> is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Gru.

Gru (Fig. 3) discloses a balun transformer/filter (200/600) comprising a plurality of coupled metal traces (transmission) lines (206, 208, 218, 220) having an unbalance signal applied to port (1) while ports (2, 3) provide output balance signals which, as known to those of ordinary skill in the art, inherently re of equal amplitude but are opposite (i.e. 180) in phase. As described with respect to Fig. 6, capacitors (e.g.  $C_{s1}$ ,  $C_{s2}$ ,  $C_{s3}$ , etc) are connected to the transmission line traces to effect tuning of the balun transformer/filter. As would have been known to those of ordinary skill in the art, by tuning the balun transformer/filter via these capacitor, the operating frequency is altered with a concomitant change <sup>in</sup> electrical length (i.e. a physical dimension) of the transmission line traces in the balun transformer/filter. In other words, an appropriate change in the capacitance of the capacitors (i.e.  $C_{s1}$ ,  $C_{s2}$ ,  $C_{s3}$ , ...) can effectively cause a reduction in the electrical length dimension of the corresponding transmission line trace.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 7, 8, 10, 35; 22; 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshima et al in view of Gou.

Hiroshima et al (figs. 1A, 1B) discloses a balun transformer/filter comprising a first conductive electrode/trace (11) capacitively coupled via capacitance (c1) to unbalance input terminal (A). A second conductive electrode/trace (12) is electrically coupled to the first electrode/trace (11). The second electrode/trace has capacitance couplings (C<sub>2</sub>, C<sub>3</sub>) to the balance terminals (B, C), respectively such as to provide balance output signals of equal amplitude but of opposite (i.e. 180°) phase. Moreover, note that a capacitance (C<sub>5</sub>) couples an end of the first electrode/trace to ground potential.

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Hiroshima<sup>m</sup> et al differs from the claimed invention in that the electrodes/traces (11, 12) are not constituted by a plurality of coupled lines and that the capacitances (C1, C2, C3, C5) are not constituted by corresponding capacitors.

Gru discloses a balun transformer/filter which provides as exemplary teaches thereof transmission lines comprised of a plurality of coupled sections. For example, conductive transmission line sections (208, 218) constitute a first coupled line section while transmission line sections (206, 220) constitute a second coupled line section. Furthermore, as disclosed with respect to Fig. 6, tuning capacitors (e.g. C<sub>s1</sub>, C<sub>s2</sub>, C<sub>s3</sub>, etc) can be placed with respect to the transmission line sections of each coupled line section.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have: (1) physically realized the first and second electrode/traces (11, 12) of Hiroshima et al as plural coupled line sections such as exemplarily taught by Gru, and (2) realized the capacitances (C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>, C<sub>5</sub>, etc) of Hiroshima et al as tuning capacitors such as taught by Gru. Such modifications would have been considered obvious since: (1) using plural coupled line sections instead of a single section would have been a mere substitution of art recognized equivalents which would not have altered the function of such sections (i.e. the coupled sections would have functioned much in the same manner as the single section line section); and (2) using physical capacitors instead of the capacitances would have provided the added benefit of imparting tunability to the Hiroshima et al balun configuration. Moreover, by adding such tuning




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capacitors and selecting their values, the effective electrical length dimensions of the coupled electrodes/traces can be altered (e.g. shorten or lengthen) as desired. For example, coupled lines normally at a quarter wavelength can be tuned by the capacitors such that their effective length dimension is less than a quarter wavelength.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tang discloses a balun having coupled lines capacitively grounded..

Any inquiry concerning this communication should be directed to Benny Lee at telephone number (703) 308-4902.

  
BENNY T. LEE  
PRIMARY EXAMINER  
ART UNIT 2817

B LEE/pj

06/03/03